EPISODE 4: *TROUBLED WATERS*

Episode 4: *Troubled Waters*, premiering Wednesday, April 27, 2005 at 10pm (check local listing)

A series of apparently unconnected crises among animal populations around the world turns out to be linked by water. The fourth hour of ***National Geographic's Strange Days on Planet Earth*** examines evidence that toxins are being spread throughout the world's water systems and explores what people can do to remedy the problem.

Around the world, at least 20 frog species have become extinct, and many surviving populations are dying out. Clues to the disappearances may be appearing in the American heartland where some frog populations are declining dramatically. An investigation into this mystery has led scientist Tyrone Hayes and his students to marshes and ponds, where a closer look at the Northern Leopard frog reveals anomalies inside the frog's reproductive organs. At the same time, U.S. farms are producing about one trillion ears of corn every year often using manmade chemicals like Atrazine, which can reach the world's waterways by wind and rain. The team's research suggests that even tiny amounts of Atrazine can be dangerous to these aquatic animals.

Elsewhere, epidemiologists in Columbia, Missouri are investigating the effects of chemicals found in tap water. They have discovered evidence of human vulnerability, reporting high miscarriage rates in women who drink tap water with elevated levels of chlorine by-products. Now they are looking at the reproductive health of men in cities versus farm areas, finding lower sperm counts in rural areas where exposure to farming chemicals through tap water is more likely.

Farther north in the waters of Canada's St. Lawrence River, biologists have discovered pods of beluga whales with some of the highest cancer rates of any wild animal studied. Dozens of chemicals have been discovered in the bodies of these St. Lawrence belugas. Some dead belugas are so full of toxins and chemical mixtures from the water that they technically qualify as hazardous waste. It's these chemical mixtures, as opposed to any one toxin in particular, that are causing scientists to worry.

And near the Great Barrier Reef, scientists try to solve another mystery. In recent years, repeated massive outbreaks of Crown of Thorns Starfish have been destroying large parts of the reef. Are these population explosions part of a natural cycle? Or could human activity be to blame? Some scientists believe the outbreaks could be related to nitrogen-rich agricultural runoff.

As invisible toxins infiltrate our water, much of that water ends up flowing straight into our coastal zones. According to one school of thought, toxins are diluted to safe levels by the time they reach the open ocean. But are the creatures that live here really protected from chemicals? In the past decades, researchers have become aware that sharks, blue fin tuna, swordfish, and killer whales often store large amounts of toxins in their tissues. Where are they being exposed? To find out, marine biologist Tierney Thys and her team with the Census of Marine Life Oceanographic Project try to discover where open-ocean animals spend their time. Thys uses new tracking devices to chart the travel habits of the animals, once widely believed to live primarily in the open ocean. Surprisingly, the tags reveal that these animals spend a lot of time close to shore, in close proximity to where toxin-filled runoff enters open water. The good news is that we are now locating the

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particular places where open-ocean species approach our shores to feed and from that information, we know where to concentrate our clean-up efforts.

Such research calls into question how we assess chemical safety. The water that animals rely on is part of a single interconnected system—the same network that provides our drinking water. Each of these stories may be part of a worldwide transformation in which Earth's vibrant waterways—its streams, rivers, estuaries and even oceans—have become massive delivery systems for invisible poisons. Yet, even as the level of water-borne toxins rises, scientists and farmers alike are discovering exciting new solutions.

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